

In the Claims

Please amend the claims on file as follows:

1. (Currently amended) A process for treating a wellbore having openings in communication with a damaged formation comprising:

running in a tubing string into the wellbore to position a propellant carrier adjacent the openings;

overbalancing the wellbore with liquid to establish hydrostatic pressure on the formation;

igniting the propellant so as to produce a pressure event and a volume of gas directed into the formation;

substantially immediately after igniting the propellant injecting low density foam ~~through~~from the tubing string and into the wellbore ~~at~~through a location~~port in the tubing string~~ above the propellant carrier so as to reduce the hydrostatic pressure and produce at least some debris from the formation and into the wellbore; and

conveying the debris from the wellbore by circulating the foam out of the wellbore to at surface until sufficient debris is removed.

2. (Original) The process for treating a wellbore of claim 1 wherein overbalancing the wellbore further comprises filling the tubing with liquid.

3. (Currently amended) The process of claim 1 wherein the injecting of foam step further comprises lowering the ~~location~~port for injecting the foam from a location above the openings to a location below the openings after the substantially immediate injection.

4. (Original) The process of claim 3 wherein the injecting of foam step further comprises continuously injecting foam while lowering the location of injecting the foam.

5. (Original) The process of claim 3 wherein the injecting of foam step further comprises stroking the tubing string to periodically alternate the location of injection of the foam from below the openings to above and returning to below the openings.

6. (Original) The process of claim 1 where the propellant ignition step further comprises:

providing a lubricator having a drop bar and a trigger; and

triggering release of the drop bar to fall through the tubing string to the propellant carrier for actuating ignition of the propellant.

7. (Currently amended) The process of claim 6 wherein the injecting of foam step further comprises opening ~~a the~~ port in the tubing string ~~above the propellant carrier actuated by the falling drop bar for injecting the low density foam therethrough.~~

8. (Original) The process of claim 7 wherein the injecting of foam step further comprises lowering the port from a location above the openings to a location below the openings.

9. (Original) The process of claim 8 wherein the injecting of foam step further comprises continuously injecting foam while lowering the location of injecting the foam.

10. (Original) The process of claim 7 wherein the injecting of foam step further comprises stroking the tubing string to periodically alternate the location of injection of the foam from below the openings to above and returning to below the openings.

11. (Original) The process of claim 1 where the propellant ignition step further comprises pumping liquid into the tubing string to a first pressure for actuating a pressure actuated firing head for actuating ignition of the propellant.

12. (Currently amended) The process of claim 11 wherein the injecting of foam step further comprises pumping liquid into the tubing string to a second pressure for actuating a pressure-actuated plug to open ~~a~~the port in the tubing string ~~above the propellant carrier for injecting the low density foam therethrough.~~

13. (Original) The process of claim 1 further comprising killing the wellbore and removing the tubing string.

14. (Currently amended) A process for treating a wellbore perforated into a formation comprising:

placing a tubing string into the wellbore having at its distal end,

a propellant carrier containing propellant; and

means for injecting foam ~~in from the tubing string above the propellant carrier and into~~ the wellbore;

positioning the propellant carrier adjacent the openings;

overbalancing the wellbore;

igniting the propellant so as to produce a volume of gas sufficient to dislodge debris in the formation;

substantially immediately after igniting the propellant injecting low density foam into the wellbore adjacent the openings using foam injecting means; and

circulating the foam into and out of the wellbore for removing debris out of the wellbore.

15. (Original) The process of claim 14 further comprising killing the wellbore and removing the tubing string.

16. (Currently amended) The process of claim 14 ~~further comprising injecting wherein the~~ means for injecting foam through ~~comprises~~ a port in the tubing string ~~adjacent the propellant carrier.~~

17. (Currently amended) The process of claim 16 further comprising lowering the port to a location below the openings immediately after the foam injection is initiated substantially immediately injected.

18. (Original) The process of claim 17 further comprising the raising and lowering of the tubing string periodically while circulating foam so as to prevent a blockage of debris forming between the tubing and the well casing.

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19. (Original) The process of claim 18 further comprising raising the port above the openings once an acceptable rate of production from the formation is achieved.

20. (Currently amended) Apparatus for treating a wellbore having an opening in the casing which are in communication with a damaged formation comprising:

a tubing string in the casing and extending downhole from surface for positioning a propellant in a propellant carrier adjacent the openings and forming an annulus between the tubing string and the casing;

means for igniting the propellant; and

means for injecting and ~~circulating~~ foam from the tubing string at an injection location adjacent the openings, and above the propellant carrier substantially immediately after the propellant is ignited, and circulating the foam up the annulus and out of the wellbore.

21. (Original) The apparatus of claim 20 further comprising:

a pup length of tubing at the top of the tubing string;

a seal between the wellbore and the pup length of tubing; and

means for raising and lowering the pup length of tubing and the tubing string so as to move the injection location between a location above the openings to a location below the openings.

22. (Original) The apparatus of claim 20 where the means for igniting the propellant comprises:

a lubricator at surface atop the tubing string and having a drop bar releasably retained therein; and

a firing head at the propellant carrier and actuable to ignite the propellant when the drop bar is released to fall down the tubing string to the propellant carrier.

23. (Original) The apparatus of claim 22 where the lubricator further comprises a trigger so as to release the drop bar.

24. (Original) The apparatus of claim 20 where the means for circulating foam comprises:

a foam injection inlet in the tubing string at surface;

a port in the tubing string adjacent and above the propellant carrier;

and

a foam discharge port from the annulus at surface.

25. (Original) The apparatus of claim 24 wherein the port further comprises a differential fill flow sub for blocking communication between the tubing string and the annulus until circulating foam.

26. (Original) The apparatus of claim 24 wherein
the means for igniting the propellant comprises a lubricator at surface
atop the tubing string and having a drop bar releasably retained therein; and a firing
head at the propellant carrier and actuable to ignite the propellant when the drop bar
is released to fall down the tubing string to the propellant carrier;
the lubricator further comprises a trigger so as to release the drop bar;
and
the port further comprises a differential fill flow sub for blocking
communication between the tubing string and the annulus and actuable with the
drop bar for circulating foam.

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